



Kees  
670-A154  
049-00187

March 30, 2015

CERTIFIED MAIL 7013 2630 0001 2576 8467

Division of Air Quality  
West Virginia Department of Environmental Protection  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304

**Re: Application for General Permit G&0A  
Four States Pad  
Marion County, West Virginia**

To Whom It May Concern:

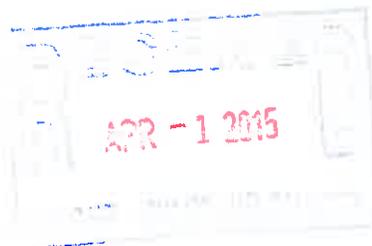
XTO Energy Inc. (XTO) hereby submits the following Application for General Permit G-70A Registration to the West Virginia Department of Environmental Protection (WVDEP) for authorization of the Four States Pad. This application has been prepared in accordance with the WVDEP Class II general permit registration requirements.

Please note that the Class II General Permit Registration Fee of \$500 has been included and two (2) copies of the registration.

Thank you in advance for your review and concurrence with this permit application. If you have any questions regarding the information presented in this submittal, please do not hesitate to contact me at (817) 885-2845.

Sincerely,

Dustin Simpson  
Environmental Advisor



**WV DEP - Division of Air Quality**

**Four States Pad**

**Marion County, West Virginia**

**WV G-70A General Permit Application**



**Prepared by:**

**Dustin Simpson**

**Environmental Advisor**

**XTO Energy, Inc.**

**3/30/2015**

**Four States Pad**  
**G 70A Permit Application**

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**Section #1**  
**Project Description**

## **Project Description**

**Four States Pad  
Marion County, West Virginia  
XTO Energy, Inc.**

XTO Energy, Inc. is submitting this G70A permit application for the Four States Pad located in Marion County, West Virginia. The facility is a natural gas production facility. The facility consists of (4) well heads, (4) two phase separators, (4) 0.5 MMBtu/hr line heaters, (4) 400 bbl produced water tanks, (1) truck loading rack, fugitive components, and other equipment typical to a natural gas production facility.

The well heads are subject to NSPS OOOO. The produced water tanks are below 6 tpy each uncontrolled and the pneumatic devices at the site are intermittent low bleed. Neither of these sources are subject to NSPS OOOO.

**Section #2**  
**G70A Application Form**



WEST VIRGINIA  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
 DIVISION OF AIR QUALITY  
 601 57<sup>th</sup> Street, SE  
 Charleston, WV 25304  
 Phone: (304) 926-0475 • www.dep.wv.gov/daq

**APPLICATION FOR GENERAL PERMIT REGISTRATION**  
 CONSTRUCT, MODIFY, RELOCATE OR ADMINISTRATIVELY UPDATE  
 A STATIONARY SOURCE OF AIR POLLUTANTS

- CONSTRUCTION     MODIFICATION     RELOCATION     CLASS I ADMINISTRATIVE UPDATE  
 CLASS II ADMINISTRATIVE UPDATE

**CHECK WHICH TYPE OF GENERAL PERMIT REGISTRATION YOU ARE APPLYING FOR:**

- |   |   |
|---|---|
| <input type="checkbox"/> <b>G10-D</b> - Coal Preparation and Handling                                   | <input type="checkbox"/> <b>G40-C</b> - Nonmetallic Minerals Processing                             |
| <input type="checkbox"/> <b>G20-B</b> - Hot Mix Asphalt   | <input type="checkbox"/> <b>G50-B</b> - Concrete Batch  |
| <input type="checkbox"/> <b>G30-D</b> - Natural Gas Compressor Stations                                 | <input type="checkbox"/> <b>G60-C</b> - Class II Emergency Generator                                |
| <input type="checkbox"/> <b>G33-A</b> - Spark Ignition Internal Combustion Engines                      | <input type="checkbox"/> <b>G65-C</b> - Class I Emergency Generator                                 |
| <input type="checkbox"/> <b>G35-A</b> - Natural Gas Compressor Stations (Flare/Glycol Dehydration Unit) | <input checked="" type="checkbox"/> <b>G70-A</b> - Class II Oil and Natural Gas Production Facility |

**SECTION I. GENERAL INFORMATION**

1. Name of applicant (as registered with the WV Secretary of State's Office): <u>XTO Energy, Inc.</u>		2. Federal Employer ID No. (FEIN): <u>75-2347769</u>	
3. Applicant's mailing address:  <u>810 Houston Street</u> <u>Fort Worth, TX 76102</u>		4. Applicant's physical address:  <u>810 Houston Street</u> <u>Fort Worth, TX 76102</u>	
5. If applicant is a subsidiary corporation, please provide the name of parent corporation:			
6. <b>WV BUSINESS REGISTRATION.</b> Is the applicant a resident of the State of West Virginia? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO - IF YES, provide a copy of the Certificate of Incorporation/ Organization / Limited Partnership (one page) including any name change amendments or other Business Registration Certificate as Attachment A. - IF NO, provide a copy of the Certificate of Authority / Authority of LLC / Registration (one page) including any name change amendments or other Business Certificate as Attachment A.			

**SECTION II. FACILITY INFORMATION**

7. Type of plant or facility (stationary source) to be constructed, modified, relocated or administratively updated (e.g., coal preparation plant, primary crusher, etc.): <u>Oil and Natural Gas Production Facility</u>	8a. Standard Industrial Classification (SIC) code: <u>1311</u>	AND	8b. North American Industry System (NAICS) code: <u>21311</u>
9. DAQ Plant ID No. (for existing facilities only):  _____	10. List all current 45CSR13 and other General Permit numbers associated with this process (for existing facilities only):  _____  _____		

**A: PRIMARY OPERATING SITE INFORMATION**

11A. Facility name of primary operating site:  <u>Four States Pad</u>	12A. Address of primary operating site:  Mailing: <u>N/A</u> Physical: _____  _____	
13A. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <span style="float:right"><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</span> - IF YES, please explain: <u>This is leased land</u>  _____ - IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.		
14A. - For <b>Modifications or Administrative Updates</b> at an existing facility, please provide directions to the present location of the facility from the nearest state road; - For <b>Construction or Relocation</b> permits, please provide directions to the proposed new site location from the nearest state road. Include a <b>MAP as Attachment F.</b> <u>Begin at intersection of I-79 &amp; WV Secondary Route 8 at Jane Lew. Travel north on I-79 approx 26.7 mi to Exit 132 (US-250/South Fairmont Exit). Make left off ramp onto US Route 250 &amp; travel approx 3.7 mi to intersection US 19-SPUR &amp; travel approx 1.0 mi to US 19. Bear left onto US 19 &amp; travel approx 6.3 mi to the intersection with WV Secondary Route 44. Turn right up WV Secondary Route 44 &amp; travel approx 1.62 mi passing Festus to an intersection with WV Secondary Route 44 &amp; an existing gravel road with cutting up the hill on the right.</u>		
15A. Nearest city or town: <u>Four States</u>	16A. County: <u>Marion</u>	17A. UTM Coordinates: Northing (KM): <u>436.98017</u> Easting (KM): <u>56.10488</u> Zone: <u>-17 N</u>
18A. Briefly describe the proposed new operation or change (s) to the facility: <u>This is an natural gas production facility with produced water tanks.</u>		19A. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits):  Latitude: <u>39.475642</u> Longitude: <u>-80.290278</u>

**B: 1<sup>ST</sup> ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits)**

11B. Name of 1 <sup>st</sup> alternate operating site:  _____  _____	12B. Address of 1 <sup>st</sup> alternate operating site:  Mailing: <u>NA</u> Physical: _____  _____
13B. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site? <span style="float:right"><input type="checkbox"/> YES <input type="checkbox"/> NO</span> - IF YES, please explain: _____  _____ - IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.	
14B. - For <b>Modifications or Administrative Updates</b> at an existing facility, please provide directions to the present location of the facility from the nearest state road; - For <b>Construction or Relocation</b> permits, please provide directions to the proposed new site location from the nearest state road. Include a <b>MAP as Attachment F.</b>  _____  _____	

15B. Nearest city or town:	16B. County:	17B. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
18B. Briefly describe the proposed new operation or change (s) to the facility:		19B. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____

**C: 2<sup>ND</sup> ALTERNATE OPERATING SITE INFORMATION (only available for G20, G40, & G50 General Permits):**

11C. Name of 2 <sup>nd</sup> alternate operating site: _____	12C. Address of 2 <sup>nd</sup> alternate operating site: Mailing: _____ Physical: _____
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13C. Does the applicant own, lease, have an option to buy, or otherwise have control of the proposed site?  YES  NO

— IF YES, please explain: \_\_\_\_\_

— IF NO, YOU ARE NOT ELIGIBLE FOR A PERMIT FOR THIS SOURCE.

14C. — For **Modifications or Administrative Updates** at an existing facility, please provide directions to the present location of the facility from the nearest state road;

— For **Construction or Relocation** permits, please provide directions to the proposed new site location from the nearest state road. Include a **MAP as Attachment F**.

\_\_\_\_\_

\_\_\_\_\_

15C. Nearest city or town:	16C. County:	17C. UTM Coordinates: Northing (KM): _____ Easting (KM): _____ Zone: _____
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18C. Briefly describe the proposed new operation or change (s) to the facility:	19C. Latitude & Longitude Coordinates (NAD83, Decimal Degrees to 5 digits): Latitude: _____ Longitude: _____
---	--

20. Provide the date of anticipated installation or change:  <u>2/26/2014</u>  <input type="checkbox"/> If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen: :  <u>2/26/2014</u>	21. Date of anticipated Start-up if registration is granted:  <u>2/26/2014</u>
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22. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application if other than 8760 hours/year. (Note: anything other than 24/7/52 may result in a restriction to the facility's operation).

Hours per day 24 Days per week 7 Weeks per year 52 Percentage of operation 100

### SECTION III. ATTACHMENTS AND SUPPORTING DOCUMENTS

23. Include a check payable to WVDEP – Division of Air Quality with the appropriate application fee (per 45CSR22 and 45CSR13).

24. Include a Table of Contents as the first page of your application package.

All of the required forms and additional information can be found under the Permitting Section (General Permits) of DAQ's website, or requested by phone.

25. Please check all attachments included with this permit application. Please refer to the appropriate reference document for an explanation of the attachments listed below.

- ATTACHMENT A : CURRENT BUSINESS CERTIFICATE
- ATTACHMENT B: PROCESS DESCRIPTION
- ATTACHMENT C: DESCRIPTION OF FUGITIVE EMISSIONS
- ATTACHMENT D: PROCESS FLOW DIAGRAM
- ATTACHMENT E: PLOT PLAN
- ATTACHMENT F: AREA MAP
- ATTACHMENT G: EQUIPMENT DATA SHEETS AND REGISTRATION SECTION APPLICABILITY FORM
- ATTACHMENT H: AIR POLLUTION CONTROL DEVICE SHEETS
- ATTACHMENT I: EMISSIONS CALCULATIONS
- ATTACHMENT J: CLASS I LEGAL ADVERTISEMENT
- ATTACHMENT K: ELECTRONIC SUBMITTAL
- ATTACHMENT L: GENERAL PERMIT REGISTRATION APPLICATION FEE
- ATTACHMENT M: SITING CRITERIA WAIVER
  
- ATTACHMENT N: MATERIAL SAFETY DATA SHEETS (MSDS)
- ATTACHMENT O: EMISSIONS SUMMARY SHEETS
- OTHER SUPPORTING DOCUMENTATION NOT DESCRIBED ABOVE (Equipment Drawings, Aggregation Discussion, etc.)

Please mail an original and two copies of the complete General Permit Registration Application with the signature(s) to the DAQ Permitting Section, at the address shown on the front page of this application. Please DO NOT fax permit applications. For questions regarding applications or West Virginia Air Pollution Rules and Regulations, please refer to the website shown on the front page of the application or call the phone number also provided on the front page of the application.

SECTION IV. CERTIFICATION OF INFORMATION

This General Permit Registration Application shall be signed below by a Responsible Official. A Responsible Official is a President, Vice President, Secretary, Treasurer, General Partner, General Manager, a member of a Board of Directors, or Owner, depending on business structure. A business may certify an Authorized Representative who shall have authority to bind the Corporation, Partnership, Limited Liability Company, Association, Joint Venture or Sole Proprietorship. Required records of daily throughput, hours of operation and maintenance, general correspondence, Emission Inventory, Certified Emission Statement, compliance certifications and all required notifications must be signed by a Responsible Official or an Authorized Representative. If a business wishes to certify an Authorized Representative, the official agreement below shall be checked off and the appropriate names and signatures entered. Any administratively incomplete or improperly signed or unsigned Registration Application will be returned to the applicant.

FOR A CORPORATION (domestic or foreign)

I certify that I am a President, Vice President, Secretary, Treasurer or in charge of a principal business function of the corporation

FOR A PARTNERSHIP

I certify that I am a General Partner

FOR A LIMITED LIABILITY COMPANY

I certify that I am a General Partner or General Manager

FOR AN ASSOCIATION

I certify that I am the President or a member of the Board of Directors

FOR A JOINT VENTURE

I certify that I am the President, General Partner or General Manager

FOR A SOLE PROPRIETORSHIP

I certify that I am the Owner and Proprietor

I hereby certify that (please print or type) Dustin Simpson is an Authorized Representative and in that capacity shall represent the interest of the business (e.g., Corporation, Partnership, Limited Liability Company, Association Joint Venture or Sole Proprietorship) and may obligate and legally bind the business. If the business changes its Authorized Representative, a Responsible Official shall notify the Director of the Office of Air Quality immediately, and/or,

I hereby certify that all information contained in this General Permit Registration Application and any supporting documents appended hereto is, to the best of my knowledge, true, accurate and complete, and that all reasonable efforts have been made to provide the most comprehensive information possible

Signature Nina Hutton 3/30/15  
(please use blue ink) Responsible Official Date

Name & Title Nina Hutton, Vice President – Environmental, Health, and Safety  
(please print or type)

Signature Dustin Simpson 3/30/15  
(please use blue ink) Authorized Representative (if applicable) Date

Applicant's Name XTO Energy, Inc.

Phone & Fax 817-885-2845 817-885-1847  
Phone Fax

Email dustin\_simpson@xtoenergy.com

**Attachment A**  
**Current Business Certificate**

# State of West Virginia



## Certificate

*I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that*

**XTO ENERGY INC.**

a corporation formed under the laws of Delaware filed an application to be registered as a foreign corporation authorizing it to transact business in West Virginia. The application was found to conform to law and a "Certificate of Authority" was issued by the West Virginia Secretary of State on May 30, 2008.

I further certify that the corporation has not been revoked by the State of West Virginia nor has a Certificate of Withdrawal been issued to the corporation by the West Virginia Secretary of State.

Accordingly, I hereby issue this

## CERTIFICATE OF AUTHORIZATION

Validation ID:6WV5R\_YEDXX

*Given under my hand and the  
Great Seal of the State of  
West Virginia on this day of  
March 10, 2015*



*Natalie E. Tennant*

*Secretary of State*

CM

# State of West Virginia



## Certificate

*I, Betty Ireland, Secretary of State of the State of West Virginia, hereby certify that*

**XTO ENERGY INC.**

**Control Number: 999BI**

a corporation formed under the laws of Delaware has filed its "Application for Certificate of Authority" to transact business in West Virginia as required by the provisions of the West Virginia Code. I hereby declare the organization to be registered as a foreign corporation from its effective date of May 30, 2008.

Therefore, I issue this

### **CERTIFICATE OF AUTHORITY**

to the corporation authorizing it to transact business in West Virginia

*Given under my hand and the Great Seal of the State of West Virginia on this day of May 30, 2008*

*Secretary of State*



Betty Ireland  
Secretary of State  
State Capitol  
1900 Kanawha Blvd. E.  
Charleston, WV 25305  
FILE ONE ORIGINAL  
FEES PER SCHEDULE

**CERTIFICATE OF  
AUTHORITY**

*Walt Madds*

Penney Barker, Manager  
Corporations Division  
Tel. (304) 558-8000  
Fax (304) 558-8381  
www.wvsos.com  
Hours: 8:30am-3:00pm  
PLEASE READ INSTRUCTIONS

CTRL # 999BI

**1. HOME STATE INFORMATION:**

- a. The name of the corporation as it is registered in its home state is: XTO Energy Inc.
- b. State of Delaware Date of Incorp. 10/9/90 Duration (# yrs. or perpetual) perpetual  
Warning: Tax reporting requirements in West Va. will not end until a withdrawal is filed.
- c. NAIC # \_\_\_\_\_ (If an insurance company)

**FILED**

**2. PRINCIPAL OFFICE INFORMATION:**

- a. Address of the principal office of the corporation: No. & Street 810 Houston Street MAY 30 2008  
City/State/Zip Fort Worth, TX 76102
- b. Mailing address, if different, from above address: Street/PO Box \_\_\_\_\_  
City/State/Zip \_\_\_\_\_

IN THE OFFICE OF  
SECRETARY OF STATE  
WEST VIRGINIA

**3. WEST VIRGINIA INFORMATION:**

- a. Corporate name to be used in W. Va.: (check one, follow instructions)  
 Home state name as listed on line 1.a. above, if available.  
 DBA name
- b. Address of registered office in West Virginia, if any: No. & Street \_\_\_\_\_  
City/State/Zip \_\_\_\_\_
- c. Mailing address in WV, if different, from above: Street/PO Box \_\_\_\_\_  
City/State/Zip \_\_\_\_\_
- d. Proposed purpose(s) for transaction of business in WV: Oil and Gas

**4. AGENT OF PROCESS:**

Properly designated person to whom notice of process may be sent, if any:

Name Corporation Service Company  
Address 209 West Washington Street, Charleston, WV 25302

5. CORPORATE STATUS INFORMATION:

- a. Corporation is organized as (check one):  For profit  
 Non-profit

b. Directors and Officers: (Add extra page if necessary; please list all officers)

Officer (see attached)	Name (see attached)	Address (see attached)

6. The number of acres of land it holds or expects to hold in West Virginia is: 0

7. Contact and Signature Information

- a. Frank G. McDonald (817) 870-2800  
Contact Name Phone Number
- b. Frank G. McDonald Sr. VP, GC and Asst. Secretary  
Print or type name of signer Title or Capacity of Signer
- c. Signature of Signer:  Date: May 8, 2008

**XTO ENERGY INC.**

**Directors:**

Class I Phillip R. Kevill, Herbert D. Simons; Vaughn O. Vennerberg II (expires 5/09)  
Class II Lane G. Collins, Scott G. Sherman, Bob R. Simpson (expires 5/10)  
Class III William H. Adams III, Keith A. Hutton, Jack P. Randall (expires 5/08)

**Business Address for XTO Energy Inc. Officers and Directors:**

810 Houston Street, Fort Worth, TX 76102

**Officers:**

Chairman of the Board and Chief Executive Officer	Bob R. Simpson
President	Keith A. Hutton
Senior Executive Vice President and Chief of Staff	Vaughn O. Vennerberg II
Executive Vice President and Chief Financial Officer	Louis G. Baldwin
Executive Vice President - Acquisitions	Timothy L. Petrus
Senior Vice President and Treasurer	Brent W. Clum
Senior Vice President - Land	James L. Death
Senior Vice President - Natural Gas Operations	Nick J. Dungey
Senior Vice President - East Texas Operations	Ken K. Kirby
Senior Vice President and Controllor	Bennie G. Kniffen
Senior Vice President, General Counsel and Assistant Secretary	Frank G. McDonald
Senior Vice President - Reservoir Engineering	F. Terry Perkins
Senior Vice President - Geology & Geophysics	Mark J. Pospisil
Senior Vice President - Land Administration	Edwin S. Ryan, Jr.
Senior Vice President - Marketing	Terry L. Schultz
Senior Vice President - Mid-Continent Operations	Douglas C. Schultze
Senior Vice President - Investor Relations and Finance	Gary D. Simpson
Senior Vice President - Engineering	Kenneth F. Staab
Senior Vice President - Taxation	Mark A. Stevens
Vice President - Financial Reporting	Scott T. Agosta
Vice President & Corporate Secretary	Virginia N. Anderson
Vice President, Associate General Counsel & Assistant Secretary	Kathy L. Cox
Vice President Operations - San Juan Division	Del L. Craddock
Vice President Operations - Permian Division & Alaska	Kyle M. Hammond
Vice President - Environmental, Health & Safety	Nina C. Hutton
Vice President Operations - Fort Worth Division	Timothy B. McIlwain
Vice President - Information Technology	L. Frank Thomas III
Vice President - Facilities	T. Joy Webster
Vice President - Human Resources	Karen S. Wilson
Assistant Treasurer	William B. Butler
Assistant Controller	Martha L. Montgomery

# Delaware

PAGE 1

*The First State*

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "XTO ENERGY INC." IS DULY INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL CORPORATE EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE SIXTH DAY OF MAY, A.D. 2008.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "XTO ENERGY INC." WAS INCORPORATED ON THE NINTH DAY OF OCTOBER, A.D. 1990.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL REPORTS HAVE BEEN FILED TO DATE.

AND I DO HEREBY FURTHER CERTIFY THAT THE FRANCHISE TAXES HAVE BEEN PAID TO DATE.



2243325 8300

080510772

You may verify this certificate online  
at [corp.delaware.gov/authver.shtml](http://corp.delaware.gov/authver.shtml)

*Harriet Smith Windsor*

Harriet Smith Windsor, Secretary of State

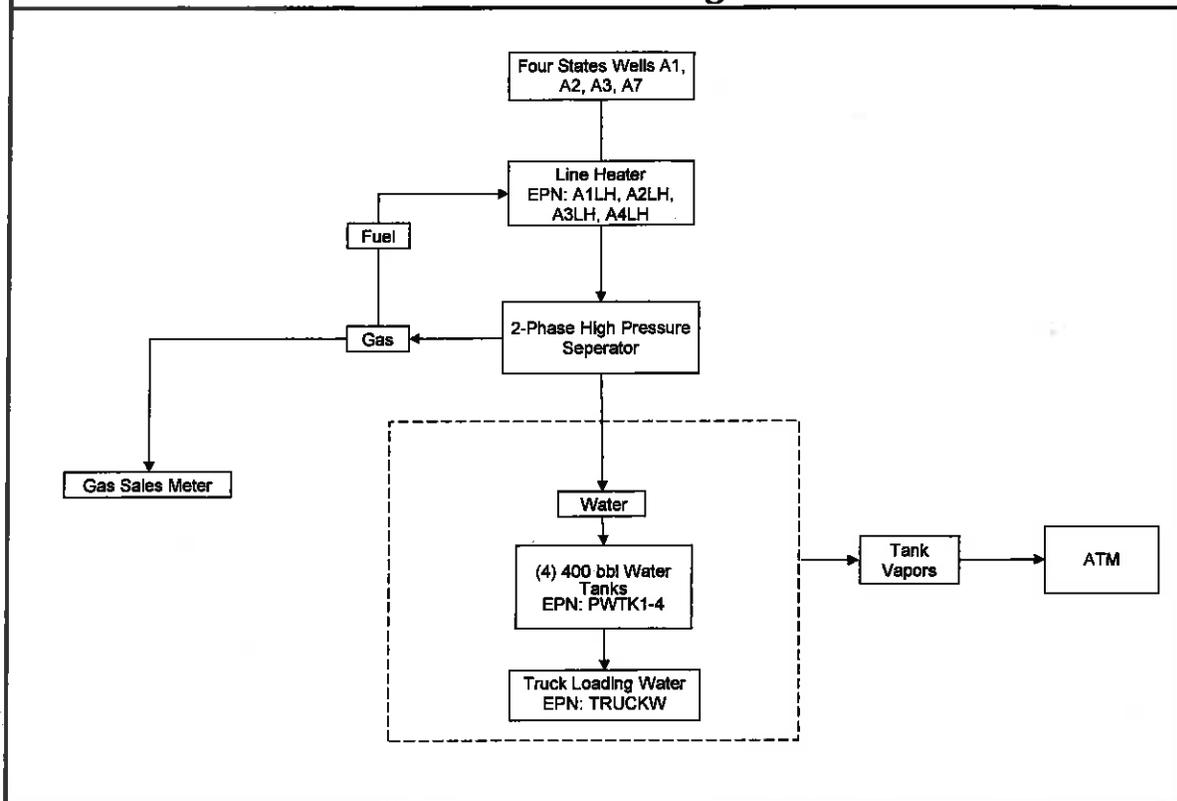
AUTHENTICATION: 6572039

DATE: 05-06-08

**Attachment B**  
**Process Description**

**XTO Energy, Inc  
Four States Pad**

**Process Flow Diagram**



**Process Description**

Associated gas and liquids production from the Four States Wells flow through a line heater and then to the the 2-phase high pressure separator. The gas is sent to sales. The produced liquids go into four (4) 400 bbl water storage tanks (PWTK1-4) on the site. Some gas is used as fuel for the line heaters to aid in keeping hydrates from freezing in the lines. Water is trucked off site from the storage tanks. Sometimes gas is vented from the equipment to allow for MSS activities. Truck loading emissions include PM emissions for the miles traveled by the loading trucks.

**Attachment C**  
**Description of Fugitive Emissions**

## **Description of Fugitive Emissions**

**Four States Pad  
Marion County, West Virginia  
XTO Energy, Inc.**

Included with this description is the G-70A Fugitive Emissions Summary Sheet. Fugitive Emissions were provided for PM10 and NMNEVOC with reference to water hauling from the storage vessels at the facility. The PM10 occurred from the traffic over an unpaved road to the well site totaling 1 mile round trip per load. The NMNEVOC occurred from vapors released during the loading of produced water.

Fugitive Emissions for NMNEVOC were provided for equipment leaks. The calculation methodology is based off AP-42 and component counts. The leak source data sheet is not included in this application because none of the sources handle material streams with a VOC weight percent greater than 10%.

Fugitive Emissions for NMNEVOC were provided for equipment blowdowns. The calculations methodology is based off material balance and the max number of equipment blowdowns annually.

All calculations for fugitive emissions can be found in Attachment I of this application.

**G70-A FUGITIVE EMISSIONS SUMMARY SHEET**

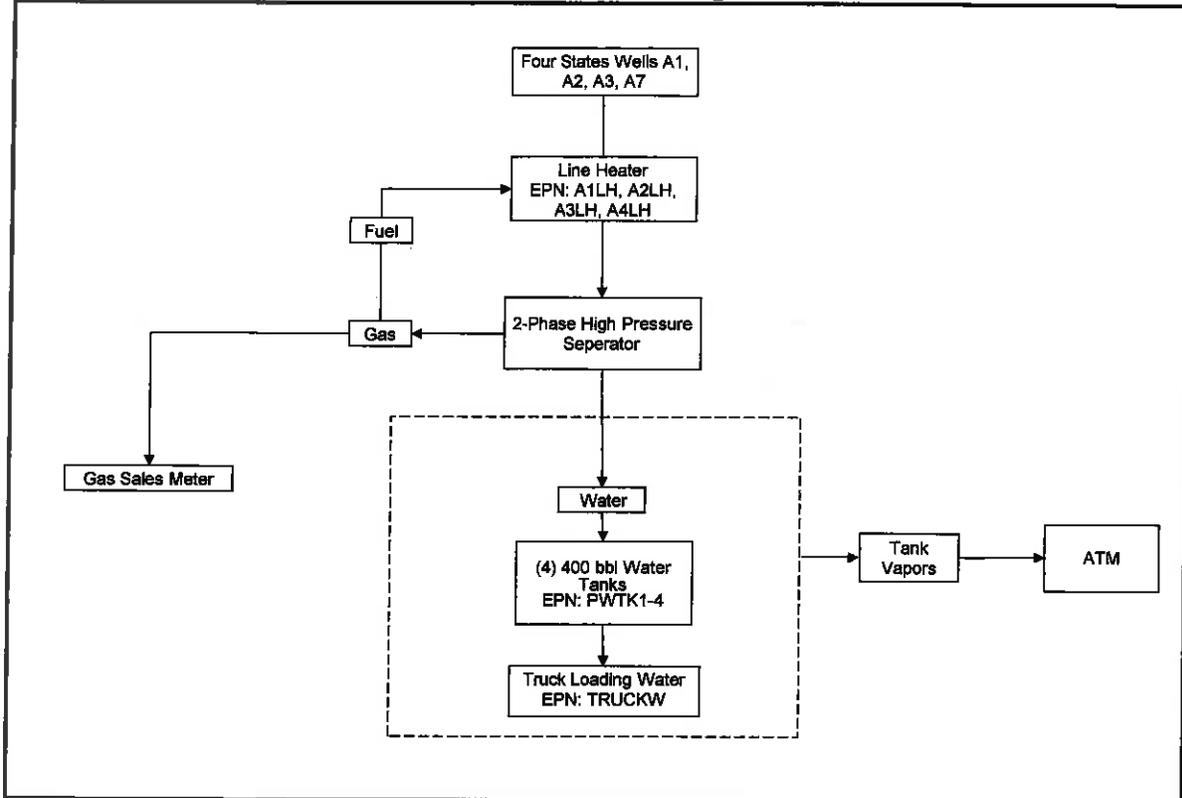
FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants <sup>1</sup> Chemical Name/CAS <sup>1</sup>	Maximum Potential Uncontrolled Emissions <sup>2</sup>		Maximum Potential Controlled Emissions <sup>3</sup>		Est. Method Used <sup>4</sup>
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads		N/A	N/A	N/A	N/A	N/A
Unpaved Haul Roads	PM10/	3.68	0.73	N/A	N/A	EE - AP42
Loading/Unloading Operations	NMNEVOC	0.03	0.01	N/A	N/A	EE - AP42
Equipment Leaks	NMNEVOC	Does not apply	0.14	Does not apply	N/A	EE - AP42/MB
Blowdown Emissions	NMNEVOC	0.56	0.01	N/A	N/A	MB
Other						

<sup>1</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.  
<sup>2</sup> Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).  
<sup>3</sup> Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).  
<sup>4</sup> Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).

**Attachment D**  
**Process Flow Diagram**

**XTO Energy, Inc  
Four States Pad**

**Process Flow Diagram**



**Process Description**

Associated gas and liquids production from the Four States Wells flow through a line heater and then to the the 2-phase high pressure separator. The gas is sent to sales. The produced liquids go into four (4) 400 bbl water storage tanks (PWTK1-4) on the site. Some gas is used as fuel for the line heaters to aid in keeping hydrates from freezing in the lines. Water is trucked off site from the storage tanks. Sometimes gas is vented from the equipment to allow for MSS activities. Truck loading emissions include PM emissions for the miles traveled by the loading trucks.

**Attachment E**  
**Plot Plan**

REVISION	BY	DATE	DESCRIPTION

DESIGNED BY: SOG  
 DRAWN BY: SOG  
 CHECKED BY: SOG  
 DATE: MARCH 2015  
 PROJECT NO.: 15107004R

**MKS**  
**Morris Knowles**  
 Consulting Engineers and Architects, Inc.  
 1225 West 10th Street  
 Oklahoma City, Oklahoma 73106  
 (405) 525-4400

**FOUR STATES**  
 prepared for  
**XTO ENERGY, INC.**  
 Farmington District, Marion County, West Virginia  
**SITE PLAN (PRELIMINARY - SUBJECT TO CHANGE)**

DRAWING NO.:  
 SHEET NO.: 1 OF 1

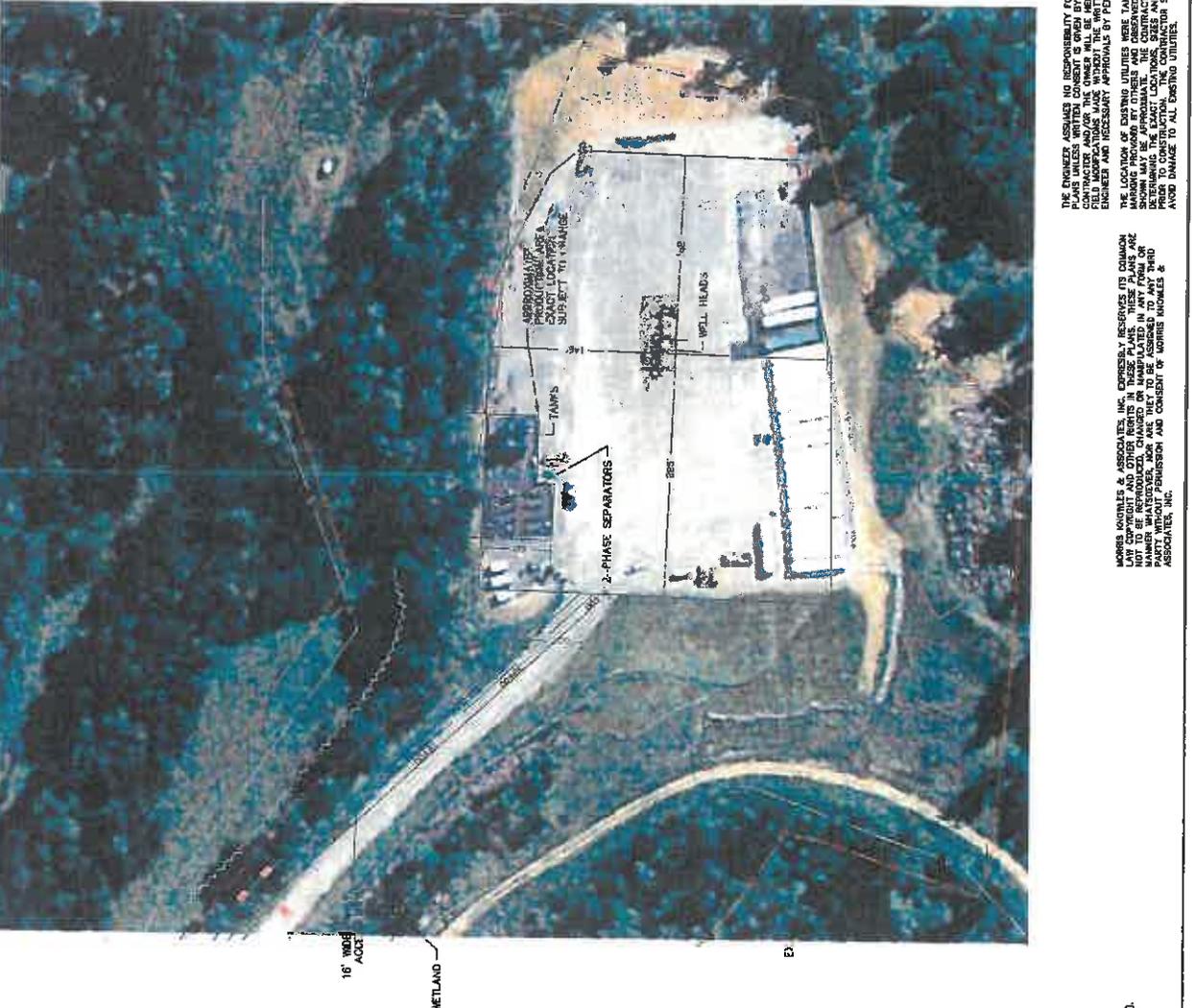
**LEGEND:**

- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- EXISTING PROPERTY LINE

**NOTES:**

1. PRODUCTION PAD LOCATION AND SIZE OBTAINED FROM PRODUCTION PAD DATA DATED 8/2/13 AND NOT FIELD LOCATED.
2. SITE PLAN IS PRELIMINARY AND SUBJECT TO CHANGE.

SCALE: 1" = 100'



THE ENGINEER ASSUMES NO RESPONSIBILITY FOR ANY CHANGES IN DESIGN OR LOCATION OF UTILITIES WHICH MAY BE MADE BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE WRITTEN CONSENT OF THE CITY ENGINEER AND NECESSARY APPROVALS BY PERMITTING AGENCIES. THE LOCATION OF EXISTING UTILITIES WERE TAKEN FROM RECORDS AND FIELD SURVEY. THE LOCATION OF UTILITIES SHOWN ON THIS PLAN ARE SHOWN AS APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION, DEPTH AND SIZE OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDING DAMAGE TO ALL EXISTING UTILITIES.

MORRIS KNOWLES & ASSOCIATES, INC. ENGINEER'S RESERVES ITS COMMON LAW COPYRIGHT AND OTHER RIGHTS IN THESE PLANS. THESE PLANS ARE NOT TO BE REPRODUCED, CHANGED OR IMITATED IN ANY FORM OR BY ANY MEANS WITHOUT PERMISSION AND CONSENT OF MORRIS KNOWLES & ASSOCIATES, INC.

CALL BEFORE YOU DIG  
 IN WEST VIRGINIA  
 1-800-245-6846

THE GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 7 WORKING DAYS IN ADVANCE AND NO LATER THAN 10:00 AM ON THE DAY OF CONSTRUCTION. (WV CHAPTER 24C-1-5, UNDERGROUND FACILITY DAMAGE PREVENTION ACT).

WV STATE LAW SERVICES  
 2 WORKING DAYS NOTICE

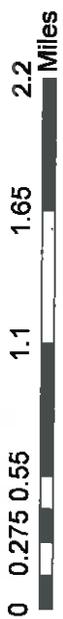
**Know what's below**  
 Call before you dig

**Attachment F**  
**Area Map**





UTM - 17N 561048.8 4369801.7  
1,265 feet above mean sea level.



1:24,000

• Attachment F point



Attachment F point 300 foot buffer



**Attachment G**  
**Emission Unit Data Sheets**

**General Permit G70-A Registration  
Section Applicability Form**

General Permit G70-A was developed to allow qualified applicants to seek registration for a variety of sources. These sources include natural gas well affected facilities, storage tanks, natural gas-fired compressor engines (RICE), natural gas producing units, natural gas-fired in-line heaters, pneumatic controllers, heater treaters, tank truck loading, glycol dehydration units, completion combustion devices, flares, enclosed combustion devices, and vapor recovery systems. All registered facilities will be subject to Sections 1.0, 2.0, 3.0, and 4.0.

General Permit G70-A allows the registrant to choose which sections of the permit they are seeking registration under. Therefore, please mark which additional sections that you are applying for registration under. If the applicant is seeking registration under multiple sections, please select all that apply. Please keep in mind, that if this registration is approved, the issued registration will state which sections will apply to your affected facility.

Section 5	Natural Gas Well Affected Facility	<input checked="" type="checkbox"/>
Section 6	Storage Vessels*	<input checked="" type="checkbox"/>
Section 7	Gas Producing Units, In-Line Heaters, Heater Treaters, and Glycol Dehydration Reboilers	<input checked="" type="checkbox"/>
Section 8	Pneumatic Controllers Affected Facility (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 9	<i>Reserved</i>	<input type="checkbox"/>
Section 10	Natural gas-fired Compressor Engine(s) (RICE) **	<input type="checkbox"/>
Section 11	Tank Truck Loading Facility ***	<input checked="" type="checkbox"/>
Section 12	Standards of Performance for Storage Vessel Affected Facilities (NSPS, Subpart OOOO)	<input type="checkbox"/>
Section 13	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (NSPS, Subpart JJJJ)	<input type="checkbox"/>
Section 14	Control Devices not subject to NSPS, Subpart OOOO	<input type="checkbox"/>
Section 15	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40CFR63, Subpart ZZZZ)	<input type="checkbox"/>
Section 16	Glycol Dehydration Units	<input type="checkbox"/>
Section 17	Dehydration Units With Exemption from NESHAP Standard, Subpart HH § 63.764(d) (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 18	Dehydration Units Subject to NESHAP Standard, Subpart HH and Not Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>
Section 19	Dehydration Units Subject to NESHAP Standard, Subpart HH and Located Within an UA/UC (40CFR63, Subpart HH)	<input type="checkbox"/>

\* Applicants that are subject to Section 6 may also be subject to Section 12 if the applicant is subject to the NSPS, Subpart OOOO control requirements or the applicable control device requirements of Section 14.

\*\* Applicants that are subject to Section 10 may also be subject to the applicable RICE requirements of Section 13 and/or Section 15.

\*\*\* Applicants that are subject to Section 11 may also be subject to control device requirements of Section 14.



## NATURAL GAS WELL AFFECTED FACILITY DATA SHEET

*Complete this data sheet if you are the owner or operator of a gas well affected facility for which construction, modification, or reconstruction commenced after August 23, 2011. This form must be completed for natural gas well affected facilities regardless of when flowback operations occur (or have occurred).*

Please provide the API number(s) for each NG well at this facility:	
047-049-02221	047-049-02236
047-049-02222	047-049-02223

*Note: This is the same API well number(s) provided in the well completion notification and as provided to the WVDEP, Office of Oil and Gas for the well permit. The API number may be provided on the application without the state code (047).*

*Every oil and gas well permitted in West Virginia since 1929 has been issued an API (American Petroleum Institute) number. This API is used by agencies to identify and track oil and gas wells.*

*The API number has the following format: 047-001-00001*

*Where,*

*047 = State code. The state code for WV is 047.*

*001 = County Code. County codes are odd numbers, beginning with 001 (Barbour) and continuing to 109 (Wyoming).*

*00001 = Well number. Each well will have a unique well number.*

## STORAGE VESSEL EMISSION UNIT DATA SHEET

*Provide the following information for each new or modified bulk liquid storage tank.*

### I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name – Four States Pad	2. Tank Name - PWTk1-PWTk4
3. Emission Unit ID number - PWTk1-PWTk4	4. Emission Point ID number - PWTk1-PWTk4
5. Date Installed or Modified <i>(for existing tanks)</i> 2/26/2014	6. Type of change: <input checked="" type="checkbox"/> New construction <input type="checkbox"/> New stored material <input type="checkbox"/> Other
7A. Description of Tank Modification <i>(if applicable)</i>	
7B. Will more than one material be stored in this tank? <i>If so, a separate form must be completed for each material.</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
7C. Provide any limitations on source operation affecting emissions. (production variation, etc.) – 50 BWPd per tank, a total of 200 BWPd	

### II. TANK INFORMATION (required)

8. Design Capacity <i>(specify barrels or gallons)</i> . Use the internal cross-sectional area multiplied by internal height. 400 bbl	
9A. Tank Internal Diameter (ft.) 12	9B. Tank Internal Height (ft.) 22
10A. Maximum Liquid Height (ft.) 20	10B. Average Liquid Height (ft.) 8
11A. Maximum Vapor Space Height (ft.) 22	11B. Average Vapor Space Height (ft.) 14
12. Nominal Capacity <i>(specify barrels or gallons)</i> . This is also known as “working volume. 400 bbl	
13A. Maximum annual throughput (gal/yr) 766,500	13B. Maximum daily throughput (gal/day) 21,000
14. Number of tank turnovers per year 45.30	15. Maximum tank fill rate (gal/min) 14.6
16. Tank fill method <input checked="" type="checkbox"/> Submerged <input type="checkbox"/> Splash <input type="checkbox"/> Bottom Loading	
17. Is the tank system a variable vapor space system? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, (A) What is the volume expansion capacity of the system (gal)? (B) What are the number of transfers into the system per year?	
18. Type of tank (check all that apply): <input checked="" type="checkbox"/> Fixed Roof <input checked="" type="checkbox"/> vertical <input type="checkbox"/> horizontal <input type="checkbox"/> flat roof <input type="checkbox"/> cone roof <input type="checkbox"/> dome roof <input type="checkbox"/> other (describe)  <input type="checkbox"/> External Floating Roof <input type="checkbox"/> pontoon roof <input type="checkbox"/> double deck roof <input type="checkbox"/> Domed External (or Covered) Floating Roof <input type="checkbox"/> Internal Floating Roof <input type="checkbox"/> vertical column support <input type="checkbox"/> self-supporting <input type="checkbox"/> Variable Vapor Space <input type="checkbox"/> lifter roof <input type="checkbox"/> diaphragm <input type="checkbox"/> Pressurized <input type="checkbox"/> spherical <input type="checkbox"/> cylindrical <input type="checkbox"/> Underground <input type="checkbox"/> Other (describe)	

### III. TANK CONSTRUCTION AND OPERATION INFORMATION *(check which one applies)*

<input checked="" type="checkbox"/> Refer to enclosed TANKS Summary Sheets
<input type="checkbox"/> Refer to the responses to items 19 – 26 in section VII

### IV. SITE INFORMATION *(check which one applies)*

<input checked="" type="checkbox"/> Refer to enclosed TANKS Summary Sheets
<input type="checkbox"/> Refer to the responses to items 27 – 33 in section VII



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25E. Is the floating roof equipped with a weather shield? <input type="checkbox"/> Yes <input type="checkbox"/> No			
25F. Describe deck fittings:			
26. Complete the following section for <b>Internal Floating Roof Tanks</b> <input type="checkbox"/> Does not apply			
26A. Deck Type: <input type="checkbox"/> Bolted <input type="checkbox"/> Welded		26B. For bolted decks, provide deck construction:	
26C. Deck seam. Continuous sheet construction: <input type="checkbox"/> 5 ft. wide <input type="checkbox"/> 6 ft. wide <input type="checkbox"/> 7 ft. wide <input type="checkbox"/> 5 x 7.5 ft. wide <input type="checkbox"/> 5 x 12 ft. wide <input type="checkbox"/> other (describe)			
26D. Deck seam length (ft.):	26E. Area of deck (ft <sup>2</sup> ):	26F. For column supported tanks, # of columns:	26G. For column supported tanks, diameter of column:
<b>SITE INFORMATION:</b>			
27. Provide the city and state on which the data in this section are based:			
28. Daily Avg. Ambient Temperature (°F):		29. Annual Avg. Maximum Temperature (°F):	
30. Annual Avg. Minimum Temperature (°F):		31. Avg. Wind Speed (mph):	
32. Annual Avg. Solar Insulation Factor (BTU/ft <sup>2</sup> -day):		33. Atmospheric Pressure (psia):	
<b>LIQUID INFORMATION:</b>			
34. Avg. daily temperature range of bulk liquid (°F):	34A. Minimum (°F):	34B. Maximum (°F):	
35. Avg. operating pressure range of tank (psig):	35A. Minimum (psig):	35B. Maximum (psig):	
36A. Minimum liquid surface temperature (°F):		36B. Corresponding vapor pressure (psia):	
37A. Avg. liquid surface temperature (°F):		37B. Corresponding vapor pressure (psia):	
38A. Maximum liquid surface temperature (°F):		38B. Corresponding vapor pressure (psia):	
39. Provide the following for each liquid or gas to be stored in the tank. Add additional pages if necessary.			
39A. Material name and composition:			
39B. CAS number:			
39C. Liquid density (lb/gal):			
39D. Liquid molecular weight (lb/lb-mole):			
39E. Vapor molecular weight (lb/lb-mole):			
39F. Maximum true vapor pressure (psia):			
39G. Maxim Reid vapor pressure (psia):			
39H. Months Storage per year. From:			
To:			

## NATURAL GAS FIRED FUEL BURNING UNITS EMISSION DATA SHEET

*Complete the information on this data for each Gas Producing Unit(s), Heater Treater(s), and in-line heater(s) at the production pad. Reboiler information should be entered on the Glycol Dehydration Emission Unit Data Sheet.*

Emission Unit ID # <sup>1</sup>	Emission Point ID# <sup>2</sup>	Emission Unit Description (Manufacturer / Model #)	Year Installed/ Modified	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>	Design Heat Input (mmBtu/hr) <sup>5</sup>	Fuel Heating Value (Btu/scf) <sup>6</sup>
A1LH	A1LH	Energy Weld Line Heater	2014	New	N/A	0.5	1020.3
A2LH	A2LH	Energy Weld Line Heater	2014	New	N/A	0.5	1020.3
A3LH	A3LH	Energy Weld Line Heater	2014	New	N/A	0.5	1020.3
A4LH	A4LH	Energy Weld Line Heater	2014	New	N/A	0.5	1020.3

<sup>1</sup> Enter the appropriate Emission Unit (or Sources) identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For sources, use 1S, 2S, 3S...or other appropriate designation. Enter glycol dehydration unit Reboiler Vent data on the *Glycol Dehydration Unit Data Sheet*.

<sup>2</sup> Enter the appropriate Emission Point identification numbers for each fuel burning unit located at the production pad. Gas Producing Unit Burners should be designated GPU-1, GPU-2, etc. Heater Treaters should be designated HT-1, HT-2, etc. Heaters or Line Heaters should be designated LH-1, LH-2, etc. For emission points, use 1E, 2E, 3E...or other appropriate designation.

<sup>3</sup> New, modification, removal

<sup>4</sup> Complete appropriate air pollution control device sheet for any control device.

<sup>5</sup> Enter design heat input capacity in mmBtu/hr.

<sup>6</sup> Enter the fuel heating value in Btu/standard cubic foot.

## TANK TRUCK LOADING EMISSION UNIT DATA SHEET

*Furnish the following information for each new or modified bulk liquid transfer area or loading rack at the natural gas production pad.  
 This form is to be used for bulk liquid transfer operations to tank trucks.*

1. Emission Unit ID: - TRUCKW	2. Emission Point ID: - TRUCKW	3. Year Installed/ Modified: 2014		
4. Emission Unit Description: Truck Loading of produced water				
5. Loading Area Data:				
5A. Number of pumps: 1	5B. Number of liquids loaded: 1	5C. Maximum number of tank trucks loading at one time: 1		
6. Describe cleaning location, compounds and procedure for tank trucks: Trucks will enter the site via a gravel road and hook up to the loading rack. The trucks will receive roughly 180 bbls of produced water. The trucks will then exit the site via the same gravel road.				
7. Are tank trucks pressure tested for leaks at this or any other location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If YES, describe:				
8. Projected Maximum Operating Schedule (for rack or transfer point as a whole):				
Maximum	Jan. - Mar.	Apr. - June	July - Sept.	Oct. - Dec.
hours/day	24	24	24	24
days/week	7	7	7	7

9. Bulk Liquid Data <i>(add pages as necessary)</i> :			
Liquid Name	Produced Water		
Max. daily throughput (1000 gal/day)	67.2		
Max. annual throughput (1000 gal/yr)	730.0		
Loading Method <sup>1</sup>	BF		
Max. Fill Rate (gal/min)	126		
Average Fill Time (min/loading)	60		
Max. Bulk Liquid Temperature (°F)	80.0		
True Vapor Pressure <sup>2</sup>	0.58		
Cargo Vessel Condition <sup>3</sup>	U		
Control Equipment or Method <sup>4</sup>	N/A		
Minimum collection efficiency (%)	N/A		
Minimum control efficiency (%)	N/A		
<i>* Continued on next page</i>			

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Maximum Emission Rate	Loading (lb/hr)	0.03		
	Annual (ton/yr)	0.01		
Estimation Method <sup>5</sup>		EPA		
Notes:				
<sup>1</sup> BF = Bottom Fill    SP = Splash Fill    SUB = Submerged Fill				
<sup>2</sup> At maximum bulk liquid temperature				
<sup>3</sup> B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)				
<sup>4</sup> List as many as apply (complete and submit appropriate <i>Air Pollution Control Device Sheets as Attachment "H"</i> ): CA = Carbon Adsorption VB = Dedicated Vapor Balance (closed system) ECD = Enclosed Combustion Device F = Flare TO = Thermal Oxidation or Incineration				
<sup>5</sup> EPA = EPA Emission Factor as stated in AP-42 MB = Material Balance TM = Test Measurement based upon test data submittal O = other (describe)				

<b>10. Proposed Monitoring, Recordkeeping, Reporting, and Testing</b> Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.	
MONITORING <i>Because there is no control device and produced water is being loaded, no monitoring should be needed for produced water truck loading.</i>	RECORDKEEPING <i>Records of the annual throughput through the facility and the run tickets will be kept.</i>
REPORTING <i>N/A</i>	TESTING <i>N/A</i>
11. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty: <i>N/A</i>	

**Attachment H**  
**Air Pollution Control Device Data Sheet**

## **Air Pollution Control Device Data Sheet**

**Four States Pad  
Marion County, West Virginia  
XTO Energy, Inc.**

There is no air pollution control devices located at the facility, and therefore no data sheets are submitted with this application.

**Attachment I**  
**Emission Calculations**

XTO Energy, Inc.  
 Four States Pad  
 Facility Emission Summary

Emissions Summary Table

Emission Source	FIN	EPN	NOx		CO		Total VOC (Excludes Total HAPs)		SO <sub>2</sub>		PM <sub>10 &amp; 2.5</sub>		Total HAPs	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Truck Loading: Produced Water	TRUCKW	TRUCKW	-	-	-	-	0.0267	0.0053	-	-	-	-	0.0000	0.0000
Fugitive Emissions: Equipment Leaks & Truck Loading Dust Emissions	FUG	FUG	-	-	-	-	0.0317	0.1388	-	-	3.6771	0.7255	0.0000	0.0000
Equipment Blowdowns: M55	EQUIP BD	BD VENT	-	-	-	-	0.5620	0.0140	-	-	-	-	0.0000	0.0000
Line Heater Well A1	A1LH	A1LH	0.0490	0.2146	0.0412	0.1803	0.0027	0.0118	0.0003	0.0013	0.0037	0.0163	0.0009	0.0040
Line Heater Well A2	A2LH	A2LH	0.0490	0.2146	0.0412	0.1803	0.0027	0.0118	0.0003	0.0013	0.0037	0.0163	0.0009	0.0040
Line Heater Well A3	A3LH	A3LH	0.0490	0.2146	0.0412	0.1803	0.0027	0.0118	0.0003	0.0013	0.0037	0.0163	0.0009	0.0040
Line Heater Well A7	A4LH	A4LH	0.0490	0.2146	0.0412	0.1803	0.0027	0.0118	0.0003	0.0013	0.0037	0.0163	0.0009	0.0040
Produced Water Tank Well A1: 400 bbl	PWTK1	PWTK1	-	-	-	-	0.0610	0.2675	-	-	-	-	0.0000	0.0000
Produced Water Tank Well A2: 400 bbl	PWTK2	PWTK2	-	-	-	-	0.0610	0.2675	-	-	-	-	0.0000	0.0000
Produced Water Tank Well A3: 400 bbl	PWTK3	PWTK3	-	-	-	-	0.0610	0.2675	-	-	-	-	0.0000	0.0000
Produced Water Tank Well A7: 400 bbl	PWTK4	PWTK4	-	-	-	-	0.0610	0.2675	-	-	-	-	0.0000	0.0000
<b>TOTAL EMISSIONS</b>			NOx		CO		Total VOC (Excludes Total HAPs)		SO <sub>2</sub>		PM <sub>10 &amp; 2.5</sub>		Total HAPs	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
			0.1960	0.8586	0.1647	0.7212	0.8752	1.2753	0.0012	0.0052	3.6920	0.7907	0.0037	0.0162

**XTO Energy, Inc.**  
**Four States Pad**  
**Gas Analysis - Representative**

**Conversion of Mole Percent to Weight Percent**

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	0.158	44.01	0.0697	0.417%
Nitrogen	0.239	28.01	0.0670	0.400%
Hydrogen Sulfide	0.000	34.08	0.0000	0.000%
Methane	96.819	16.04	15.5317	92.902%
Ethane	3.134	30.07	0.9424	5.637%
Propane	0.206	44.10	0.0910	0.544%
Iso-Butane	0.007	58.12	0.0041	0.025%
N-Butane	0.018	58.12	0.0105	0.063%
Iso-Pentane	0.001	72.15	0.0009	0.005%
N-Pentane	0.002	72.15	0.0011	0.006%
n-Hexane	0.000	86.18	0.0000	0.000%
Hexanes	0.000	86.16	0.0000	0.000%
2,4-Dimethylpentane	0.000	114.24	0.0000	0.000%
Methycyclohexane	0.000	96.00	0.0000	0.000%
Benzene	0.000	78.11	0.0000	0.000%
Cyclohexane	0.000	84.51	0.0000	0.000%
Heptanes	0.000	100.20	0.0000	0.000%
Toluene	0.000	92.13	0.0000	0.000%
Ethylbenzene	0.000	106.17	0.0000	0.000%
Xylenes	0.000	106.17	0.0000	0.000%
Octanes	0.000	114.23	0.0000	0.000%
Nonanes	0.000	128.28	0.0000	0.000%
Decanes+	0.000	155.00	0.0000	0.000%
Total	100.585	-	16.72	100.000%

Molecular Weight	16.72	
Relative Density	0.58	
Lower Heating Value	1020.3	
NMHC	1.0500	6.280%
VOCs (NMNEHC)	0.1076	0.643%
HAPs	0.0000	0.000%
Total HC	16.5817	99.183%
THC:VOC Ratio	0.6487	0.649%

XTO Energy, Inc.  
Four States Pad  
Fugitive Emissions - VOC

Fugitive Emission Calculations

Component Type	Service	Estimated Components Count	Hours	Factors	Total VOC Weight %	Emissions	
						lb/year	tons/year
Valves	Gas/Vapor	120	8760	0.00992000	0.64%	67.0886	0.0335
	Light Oil		8760	0.00550000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00001900	10.00%	0.0000	0.0000
	Water/Light Oil	100	8760	0.00021600	10.00%	18.9216	0.0095
Pumps	Gas/Vapor		8760	0.00529000	0.64%	0.0000	0.0000
	Light Oil		8760	0.02866000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00113000	10.00%	0.0000	0.0000
	Water/Light Oil	2	8760	0.00005300	10.00%	0.0929	0.0000
Flanges	Gas/Vapor	200	8760	0.00086000	0.64%	9.6936	0.0048
	Light Oil		8760	0.00024300	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00000086	10.00%	0.0000	0.0000
	Water/Light Oil	200	8760	0.00000620	10.00%	1.0862	0.0005
Open-ended Lines	Gas/Vapor	4	8760	0.00441000	0.64%	0.9942	0.0005
	Light Oil		8760	0.00309000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00030900	10.00%	0.0000	0.0000
	Water/Light Oil	8	8760	0.00055000	10.00%	3.8544	0.0019
Connectors	Gas/Vapor	160	8760	0.00044000	0.64%	3.9676	0.0020
	Light Oil		8760	0.00046300	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00001700	10.00%	0.0000	0.0000
	Water/Light Oil	120	8760	0.00024300	10.00%	25.5442	0.0128
Other:	Gas/Vapor	10	8760	0.01940000	0.64%	10.9335	0.0055
	Light Oil		8760	0.01650000	10.00%	0.0000	0.0000
	Heavy Oil		8760	0.00006800	10.00%	0.0000	0.0000
	Water/Light Oil	5	8760	0.03090000	10.00%	135.3420	0.0677

Total VOC Emissions	lb/hr	lb/year	TPY
		0.032	277.519
HAPs	0.000	0.000	0.000

XTO Energy, Inc.

Four States Pad

Line Heater Burner Calculations

CRITERIA & REGULATED POLLUTANTS

EPN	Fuel Gas (BTU/SCF)	Operating Hours	Burner Rating (MMBTU/Hr)	AP-42 Factors lb/MMSCF						lb/hr						tpy					
				NOx	CO	VOC	SO <sub>2</sub>	PM <sub>10.4.2.5</sub>	PM <sub>2.5</sub>	NOx	CO	VOC	SO <sub>2</sub>	PM <sub>10.4.2.5</sub>	PM <sub>2.5</sub>	NOx	CO	VOC	SO <sub>2</sub>	PM <sub>10.4.2.5</sub>	PM <sub>2.5</sub>
A1LH	1020.3	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.215	0.180	0.012	0.001	0.001	0.016	0.016	
A2LH	1020.3	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.215	0.180	0.012	0.001	0.001	0.016	0.016	
A3LH	1020.3	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.215	0.180	0.012	0.001	0.001	0.016	0.016	
A7LH	1020.3	8760	0.50	100	84	5.5	0.6	7.6	0.049	0.041	0.003	0.000	0.004	0.215	0.180	0.012	0.001	0.001	0.016	0.016	

\*Source: AP-42 Table 1.4-1, 1.4-2, & 1.4-3

Total (tpy)		NOx	CO	VOC	SO <sub>2</sub>	PM <sub>10.4.2.5</sub>	PM <sub>2.5</sub>
		0.859	0.721	0.047	0.005	0.065	0.065

XTO Energy, Inc.

Four States Pad

Line Heater Burner Calculations

**HAZARDOUS AIR POLLUTANTS (HAPs)**

EPN	Fuel Gas (BTU/SCF)	Operating Hours	Burner Rating (MMBTU/Hr)	AP-42 Factors							lb/hr				tpy			
				Benzene	Toluene	N-Hexane	HCHO	Dichlorobenz.	Benzene	Toluene	N-Hexane	HCHO	Dichlorobenz.	Benzene	Toluene	N-Hexane	HCHO	Dichlorobenz.
A1LH	1020.3	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000882	0.000037	0.000001	0.000005	0.000007	0.003864	0.000161	0.000003
A2LH	1020.3	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000882	0.000037	0.000001	0.000005	0.000007	0.003864	0.000161	0.000003
A3LH	1020.3	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000882	0.000037	0.000001	0.000005	0.000007	0.003864	0.000161	0.000003
A4LH	1020.3	8760	0.500	0.0021	0.0034	1.8	0.0750	0.0012	0.000001	0.000002	0.000882	0.000037	0.000001	0.000005	0.000007	0.003864	0.000161	0.000003

Total Individual HAPs (tpy)				Benzene	Toluene	Hexane	HCHO	Dichlorobenz.
				0.000018	0.000029	0.016464	0.000644	0.000010

Total Combined HAPs (tpy)		0.01616
---------------------------	--	---------

\*Source: AP-42 Table 1.A-1, 1.A-2, & 1.A-3

**XTO Energy, Inc.**

**Four States Pad**

**Produced Water Storage Tanks**

**Emissions Calculations - Total Tank Emissions**

Average BWPD	Number of Produced Water Tanks	Emissions Controlled (Yes/No)	Control Type (Flare, VRU, etc.)
200	4	No	N/A

Total Uncontrolled Emissions - Emission Rate for All Tanks Combined			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.244	lb/hr	0.000	lb/hr
1.070	tpy	0.000	tpy

Total Uncontrolled Emissions - Emission Rates Per Tank			
Uncontrolled VOC Emissions		Uncontrolled HAP Emissions	
0.061	lb/hr	0.000	lb/hr
0.268	tpy	0.000	tpy

**Tank Emissions are based from Tanks 4.09d calculations**

**XTO Energy, Inc.**  
**Four States Pad**  
**PRODUCED WATER TRUCK LOADING EMISSIONS**

**Truck Loading Losses Calculations**

<b>Produced Water Production:</b>	<b>200</b>	<b>bbls / Day</b>
<b>Operating Schedule</b>	<b>365</b>	<b>Day / Year</b>
<b>Total Production:</b>	<b>73000</b>	<b>bbls / Year</b>

$$LL = 12.46 * SPM/T * (1-EFF/100)$$

Saturation Factor (S) =	0.6
True Vapor Pressure of liquid loaded (P) =	0.58
Temperature of bulk liquid loaded in Rankin (T) =	540.0
Molecular Weight (M) <sup>1</sup> =	42.71
Control Efficiency * Collection Efficiency (EFF) =	0
LL (lb Total HC / bbl Throughput) =	0.0145
Estimated Throughput (bbls/Year) =	73000
Truck Loading Rate (bbls/hour) =	185
Estimated # of Loads (Approximately 1 hr/Load) =	395

<b>Total VOC Emissions</b> (Calculated as 100%, then reduced by 99%)	lb/hr	TPY
	0.03	0.01

<sup>1</sup>Molecular Weight is from Tanks 4.09 d report

XTO Energy, Inc.

Four States Pad

MSS Gas Analysis

Conversion of Mole Percent to Weight Percent

Component	Mole %	MW	Mole % *MW	Weight %
Carbon Dioxide	0.1584	44.0150	0.0697	0.417%
Nitrogen	0.2390	28.0137	0.0670	0.400%
Hydrogen Sulfide	0.0000	34.0800	0.0000	0.000%
Methane	96.8189	16.0420	15.5317	92.902%
Ethane	3.1342	30.0685	0.9424	5.637%
Propane	0.2064	44.1000	0.0910	0.544%
Iso-Butane	0.0071	58.1200	0.0041	0.025%
N-Butane	0.0180	58.1200	0.0105	0.063%
Iso-Pentane	0.0012	72.1500	0.0009	0.005%
N-Pentane	0.0015	72.1517	0.0011	0.006%
n-Hexane	0.0000	86.1800	0.0000	0.000%
Hexane +	0.0000	86.1600	0.0000	0.000%
2,4-Dimethylpentane	0.0000	114.2400	0.0000	0.000%
Methycyclohexane	0.0000	96.0000	0.0000	0.000%
Benzene	0.0000	78.1100	0.0000	0.000%
Cyclohexane	0.0000	84.5062	0.0000	0.000%
Heptanes	0.0000	100.2000	0.0000	0.000%
Toluene	0.0000	92.1300	0.0000	0.000%
Ethylbenzene	0.0000	106.1700	0.0000	0.000%
Xylenes	0.0000	106.1700	0.0000	0.000%
Octanes+	0.0000	114.2300	0.0000	0.000%
Nonanes+	0.0000	128.2800	0.0000	0.000%
Decanes+	0.0000	155.0000	0.0000	0.000%
Total	100.58	-	-	100.000%

Molecular Weight	16.72	
Specific Gravity	0.58	
Gross WET BTU	1020.3	
NMHC	1.0500	6.280%
VOCs (NMNEHC)	0.1076	0.643%
HAPs	0.0000	0.00%
H2S Mole Fraction	0.0000	0.000%
Total HC	16.5817	99.183%
THC:VOC Ratio	0.6487	0.649%

XTO Energy, Inc.

Four States Pad

Equipment Blowdowns & Purging Emissions

Equipment Blowdowns & Purging - Emission Calculations

Vessel Information - (Basis for Volume: Compressor Discharge Filter Separator)		
Volume of the Vessels	50.27	ft <sup>3</sup>
Estimated Volume of Gas in Vessel Under Pressure <sup>1</sup>	734.15	Standard ft <sup>3</sup>
Vessel Pressure	200	psig
Vessel Pressure	214.7	psia
Vessel / Atmospheric Temperature	80	°F
Vessel / Atmospheric Temperature	540	°R

Gas Composition Information		
Atmospheric Pressure	14.7	Psia
Universal Gas Constant (R)	10.73	ft <sup>3</sup> psi / °R lb-mol
Molecular Weight	16.72	lb/lb-mole
Compressibility Factor	0.9962	Z
VOC Weight Percent	0.64%	Percentage
HAP Weight Percent	0.00%	Percentage
H <sub>2</sub> S Weight Percent	0.00%	Percentage
Ending Gas Density (ρ <sub>2</sub> ) <sup>2</sup>	0.0426	lb/ft <sup>3</sup>
Starting Gas Density (ρ <sub>1</sub> ) <sup>3</sup>	0.6218	lb/ft <sup>3</sup>
Density (ρ <sub>TOTAL</sub> ) <sup>4</sup>	0.5793	lb/ft <sup>3</sup>

Emission Calculations		
Density (ρ <sub>TOTAL</sub> )	0.5793	lb/ft <sup>3</sup>
Estimated Max Amount of Gas Vented <sup>5</sup>	29.12	lbs/Event
Estimated Number of Equipment Blowdowns	50	Events/Year
Estimated Equipment Purge Count	3	Times/Event
Estimated Total Amount of Gas Released (Includes Methane & Ethane)	4367.62	lbs/Year
Estimated Total Amount of Gas Released (Includes Methane & Ethane)	2.18	Tons/Year

Estimated Total Emissions		
Total VOC Emissions (Includes Total HAPs)	28.10	lbs/Year
	0.56	lbs/Event
	0.01	Tons/Year
Total HAPs Emissions	0.00	lbs/Year
	0.00	lbs/Event
	0.000	Tons/Year

Calculation Methodology		
<sup>1</sup> Ideal Gas Law - Constant Temp: (V <sub>1</sub> * P <sub>1</sub> ) / P <sub>2</sub>	<sup>2</sup> ρ <sub>1</sub> =(P <sub>1</sub> *MW)/R*T <sub>1</sub> *Z	<sup>3</sup> ρ <sub>2</sub> =(P <sub>2</sub> *MW)/R*T <sub>2</sub> *Z
<sup>4</sup> ρ <sub>TOTAL</sub> = ρ <sub>1</sub> - ρ <sub>2</sub>	<sup>5</sup> Estimated Max Gas Vented (lb/Event) = ρ <sub>TOTAL</sub> * V <sub>1</sub>	

**Mountain Gathering, LLC**  
**Homer City PP Compressor Station**  
**Truck Loading Dust Emissions**

**Truck Loading Losses Calculations**

<b># of Truck Loads</b>	<b>395</b>	<b>Year</b>
<b>Total miles traveled per load</b>	<b>1</b>	<b>Mile</b>

$$E = k(s/12)^a(W/3)^b$$

empirical constant for PM <sub>10</sub> (k) =	1.5
surface material silt content (s) =	8.90
empirical constant for PM <sub>10</sub> (a) =	0.9
mean vehicle weight (tons) (w) =	40.00
empirical constant for PM <sub>10</sub> (b) =	0.45
lbs per vehicle mile traveled (E) =	3.6771
lbs for total vehicle miles traveled per year =	1450.95

<b>Total PM Emissions</b>	lb/hr	TPY
	3.68	0.73

\*AP-42 Chapter 13.2.2-2 equation (1a) for unpaved surfaces at industrial sites

**Attachment J**  
**Class I Legal Advertisement**

## **AIR QUALITY PERMIT NOTICE Notice of Application**

Notice is given that XTO Energy, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a General Permit Registration for a Class II Oil and Natural Gas Production Facility located on States Rd, near Four States in Marion County, West Virginia. The latitude and longitude coordinates are: 39.475642, -80.290278.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: 0.86 TPY NO<sub>x</sub>, 0.7212 TPY CO, 1.28 TPY VOC, 0.01 TPY SO<sub>2</sub>, 0.79 TPY PM, 0.02 TPY HAPs).

Startup of operation is planned to begin on or about the 26 day of February, 2014. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57<sup>th</sup> Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 31<sup>st</sup> day of March, 2015.

By: XTO Energy, Inc.  
Nina Hutton  
VP - EHS  
810 Houston Street  
Fort Worth, TX 76102

- *This Legal Notice was run in the Time West Virginian on March 31, 2015.*

**Attachment K**  
**Electronic Submittal**

**Electronic Submittal**

**Four States Pad  
Marion County, West Virginia  
XTO Energy, Inc.**

There are no electronic files submitted with this application.

**Attachment L**  
**Application Fee**

100039630

XTO ENERGY INC.

FORT WORTH, TEXAS 76102-6298

817-885-2195

INVOICE NUMBER / DESCRIPTION	INVOICE DATE	INVOICE AMOUNT
REQ 03192015A WV 2014-2015 OPERATING FEES FO	3/19/2015	500.00
VENDOR NUMBER 8009190	VENDOR NAME WEST VIRGINIA DEPARTMENT OF	CHECK NUMBER 0007711958
		CHECK TOTAL \$500.00

REMITTANCE ADVICE PLEASE DETACH STUB BEFORE DEPOSITING CHECK

THE ORIGINAL DOCUMENT HAS A WHITE REFLECTIVE WATERMARK ON THE BACK HOLD AT AN ANGLE TO VIEW DO NOT CASH IF NOT PRESENT



XTO ENERGY INC.  
810 HOUSTON ST FORT WORTH, TEXAS 76102-6298

JPMorgan Chase Bank, N.A.  
Columbia, OH  
56-754-731

0007711958

CHECK NO. 0007711958 VENDOR NO. 8009190 DATE 3/27/15

EXACTLY FIVE HUNDRED DOLLARS AND ZERO CENTS

PAYS \$500.00

VOID AFTER 90 DAYS  
VENDOR

000071032715

PAY TO THE  
ORDER OF:

WEST VIRGINIA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS  
601 57TH STREET, S.E.  
CHARLESTON, WV 25304-2345

*Evan M Van Kirk*  
AUTHORIZED SIGNATURE

0007711958 044115443

741397558

**Attachment M**  
**Siting Criteria Waiver**

## **Siting Criteria Waiver**

**Four States Pad  
Marion County, West Virginia  
XTO Energy, Inc.**

A Siting Criteria Waiver is not required for this application. The facility is greater than 300 feet from the nearest receptor.

**Attachment N**  
**Material Safety Data Sheets**

MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)



Revision Date: February 05, 2015  
Supersedes Date: January 26, 2012

**Section 1: PRODUCT AND COMPANY IDENTIFICATION**

FortisBC  
16705 Fraser Highway  
Surrey, BC  
V3S 2X7

Company Phone Number: (604) 576-7000  
Emergency Phone Number: 1-800-663-9911

Product Name: Natural Gas (Pipeline Quality)  
Material Use: Fuel

Manufacturer: Duke Energy Inc.  
1333 West Georgia Street  
Vancouver, BC  
V6E 3K9

Supplier: FortisBC  
16705 Fraser Highway  
Surrey, BC  
V3S 2X7

WHMIS Class: A – Compressed Gas;  
B1 – Flammable and Combustible Material – Division 1 Flammable Gases  
UN/PIN Number: 1971  
TDG Classification: Class 2.1 Flammable Gases  
TDG Shipping Name: Natural gas, compressed with high methane content  
Chemical Family: Simple hydrocarbon  
Chemical Formula: Natural gas (considered a complex mixture)  
Molecular Weight: Not applicable (natural gas is considered a complex mixture)  
CAS Number: 8006-14-2  
Trade Names / Synonyms: Methane, marsh gas

**Section 2: HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW**

Appearance/Odour: Gas like odour and colourless gas  
Flammable: Yes. Can cause flash fire  
Potential Health Effects: See Section 11 for more information  
Potential Environmental Effects: See Section 12 for more information  
Likely Routes of Exposure: Acute inhalation  
Acute Inhalation: At high concentrations, natural gas can displace oxygen causing asphyxiation and cause central nervous system (CNS) depression and cardiac sensitization.  
Eye and Skin Contact: None  
Chronic- Inhalation: None  
Ingestion: None  
Skin Adsorption: None

**Section 3: COMPOSITION / INFORMATION ON INGREDIENTS**

Component	CAS #	% by Wt.	Exposure Limits <sup>NOTE 1</sup>
Methane	74-82-8	95	Simple asphyxiant
Ethane	74-84-0	3	Simple asphyxiant
Propane	74-98-6	1	Simple asphyxiant
Inert Gas	Not available	<1	Not available
Sulphur Compounds	Not available	Trace	Not available
Mercaptan Odourant	Mixture	3 ppm	0.5 ppm (ethyl mercaptan) 0.5 ppm (methyl mercaptan)

## MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

NOTE 1. See Section 8 for additional exposure limit information for C<sub>1</sub> to C<sub>3</sub> Aliphatic Hydrocarbon Gases (i.e., methane, ethane, propane).

### Section 4: FIRST AID MEASURES

**Skin Contact:** First aid is not normally required.  
**Eye contact:** If irritation/redness develops, move victim away from exposure into fresh air and flush eyes with clean water.  
**Inhalation:** Ensure your own safety before attempting rescue. Move victim to fresh air. Administer oxygen if breathing has stopped. If heart beat can not be detected begin CPR. If person is overcome or been adversely affected by the emergency, obtain medical attention immediately.  
**Ingestion:** Unlikely route of exposure as this is a gas at normal room temperature and pressure.  
**General Advice:** Use extreme care in handling due to high flammability.

### Section 5: FIRE FIGHTING MEASURES

**Flammability:** Flammable gas and can be ignited by heat, flames, sparks or other sources of ignition (e.g., static electricity, pilot lights or mechanical/electrical equipment).  
**Suitable Extinguishing Media:** Dry chemical, carbon dioxide, water spray or fog.  
**Special Procedures:** Shut off flow of gas from a safe location. Use full protective equipment and self-contained breathing apparatus (SCBA). Do not extinguish flame until gas flow is shut off. Use gas detectors in confined spaces. Evaporate area if cooling of containers is not possible. For large fires nonessential personnel should be evacuated beyond 750 metres.  
**Products of Combustion:** Carbon dioxide and carbon monoxide  
**Protection of Firefighters:** Firefighters should wear SCBA in case of oxygen deficient atmosphere.  
**Sensitivity to Static Discharge:** Flammable  
**Sensitivity to Mechanical Impact:** None  
**Explosive Power:** Not available  
**Rate of Burning:** Not available  
**TDG Flammability Class** 2.1

### Section 6: ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Use personal protection recommended in Section 8.  
**Environmental Precautions:** Not applicable  
**Leak and Spill Procedure:** Evacuate area. Call emergency services and gas supplier. For large releases nonessential personnel should be evacuated beyond 750 metres. Eliminate any source of ignition.  
**Methods for Containment:** Stay away and upwind of spill/release.  
**Waste Disposal:** Vent to outside atmosphere.  
**Other Information:** Allow to vapourize and disperse to atmosphere.

In case of an emergency and no response at FortisBC, call SERVICE CENTER: 1 (800) 663-9911.

### Section 7: HANDLING AND STORAGE

**Handling:** Observe handling regulations for compressed gases and flammable materials. To be handled by trained personnel only and followed with approved operating procedures.  
**Storage:** Comply with storage regulations for compressed gases and flammable materials. No smoking or open flames in storage area.

## MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

### Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Limits:** Simple asphyxiant - Maintain a minimum 19.5% oxygen (O<sub>2</sub>) content (below 19.5% O<sub>2</sub> is considered to be O<sub>2</sub> deficient).

Constituent <sup>NOTE 2</sup>	ACGIH (8-hour TWA)	WorkSafeBC (8-hour TWA)
Methane	Minimum O <sub>2</sub> content	1000 ppm
Ethane	Minimum O <sub>2</sub> content	1000 ppm
Propane	Minimum O <sub>2</sub> content	1000 ppm
Mercaptan Odourant	0.5 ppm (ethyl mercaptan)	0.5 ppm (ethyl mercaptan)
	0.5 ppm (methyl mercaptan)	0.5 ppm (methyl mercaptan)

NOTE 2. Mercaptan odourant mixtures commonly contain ethyl mercaptan and/or methyl mercaptan (both ethyl mercaptan and methyl mercaptan have 8-hour TWA exposure limits of 0.5 ppm).

#### Personal Protective Equipment:

Ensure use of proper personal protective equipment (PPE) at all times when handling this product.

#### Eye/face:

Eye protection (e.g., safety glasses) and/or face shields.

#### Skin:

Safety work boots. Chemical resistant gloves are not required but recommended as good practice when handling chemicals. Flame retardant clothing should be worn in potentially flammable areas.

#### Respiratory:

If engineering controls and work practices are not effective in controlling exposure to natural gas, then wear suitable respiratory protection. Supplied air or SCBA.

**Other Considerations:** None

**Engineering Controls:** All installations (i.e., mechanical ventilation) must conform to code requirements. Provide adequate ventilation to maintain below exposure limits and explosive limits.

### Section 9: PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State:</b>	Gas
<b>Colour:</b>	Colourless
<b>Odour:</b>	Gas odour
<b>Specific Gravity (Water = 1):</b>	Not applicable
<b>Odour Threshold (ppm):</b>	2500
<b>Vapour Pressure (mm Hg):</b>	Not applicable
<b>Vapour Density (Air = 1):</b>	0.59
<b>Evaporation Rate (nButAC = 1):</b>	Not applicable (gas at room temperature)
<b>Boiling Point (°C):</b>	-160
<b>Freezing Point (°C):</b>	Not applicable
<b>Solubility in water (20°C):</b>	Slight
<b>Percent Volatile (by volume):</b>	Not available
<b>pH:</b>	Not available
<b>Density (g/ml):</b>	Not available
<b>Partition Coefficient (water/oil):</b>	Not available
<b>Flash Point (°C):</b>	Flammable gas
<b>Flammability (solid, gas):</b>	Flammable gas
<b>Lower Explosion Limit (%):</b>	5 (by volume)
<b>Upper Explosion Limit (%):</b>	15 (by volume)
<b>Auto-ignition Temperature (°C):</b>	537

### Section 10: STABILITY AND REACTIVITY

**Chemical Stability:** Yes

## MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

<b>Conditions to Avoid:</b>	High heat
<b>Incompatibility with Other Substances:</b>	Avoid contact with strong oxidizing agents
<b>Hazardous Decomposition Products:</b>	COx, luminous clean flame on combustion
<b>Reactivity (and Under What Conditions):</b>	Strong oxidizing agents increase risk of fire (peroxides, perchlorates, chlorine, liquid oxygen).

### Section 11: TOXICOLOGICAL INFORMATION

<b>LD50:</b>	Not applicable
<b>LC50:</b>	Not applicable
<b>Acute Effects:</b>	Simple asphyxiant: at high concentrations, natural gas can displace oxygen and cause asphyxiation. The ACGIH TLV-TWA for C <sub>1</sub> to C <sub>3</sub> Aliphatic Hydrocarbon Gases is believed to be protective against potential health effects that include CNS depression and cardiac sensitization. The TLV-TWA is based upon the abilities of these gases (methane, ethane, propane) to produce weak depressant effects on the CNS at high concentration levels approaching the lower explosive limit. It has also been reported that ethane and propane can induce cardiac arrhythmias under certain conditions leading to ventricular fibrillation which can result in death in the presence of high epinephrine levels.
<b>Chronic Effects:</b>	None
<b>Carcinogenicity:</b>	Not considered carcinogenic by IARC, NTP, ACGIH or OSHA.
<b>Reproductive Effects:</b>	Not available
<b>Teratogenicity:</b>	Not available
<b>Mutagenicity:</b>	Not available
<b>Irritant:</b>	Not available
<b>Sensitizer:</b>	Not available
<b>Synergistic Effects:</b>	Not available

### Section 12: ECOLOGICAL INFORMATION

<b>Ecotoxicity:</b>	Not available
<b>Persistence/ Degradability:</b>	Not available
<b>Bioaccumulation/ Accumulation:</b>	Not available

There is no information available on the ecotoxicological effects of natural gas. Because of the high volatility of natural gas, it is unlikely to cause ground or water pollution. Natural gas released into the environment will disperse rapidly into the atmosphere and undergo photochemical degradation.

### Section 13: DISPOSAL CONSIDERATIONS

<b>Disposal:</b>	Allow to dissipate to the atmosphere (if permitted by federal/provincial/municipal requirements). Dispose in a safe location, preferably by burning with a flare. If disposal of natural gas cannot be flared, care must be taken to ensure complete dissipation of the gas to a concentration below its flammable limits.
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### Section 14: TRANSPORT INFORMATION

<b>TDG Classification:</b>	Class 2.1 Flammable Gases
<b>UN/PIN Number:</b>	1971
<b>TDG Shipping Description:</b>	Natural gas, compressed with high methane content
<b>Special Shipping Information:</b>	Handle as extremely flammable gas. Electronically ground/bond during transfer to avoid static accumulation. Precaution should be taken to minimize inhalation of natural gas.

## MATERIAL SAFETY DATA SHEET – NATURAL GAS (PIPELINE QUALITY - MSDS #526)

### Section 15: REGULATORY INFORMATION

**DSL (Canada):** This product is on the DSL list (Canada).  
**WHMIS Class:** A – Compressed Gas;  
B1 – Flammable and Combustible Material – Division 1 Flammable Gases

### Section 16: OTHER INFORMATION

#### National Fire Protection Association (NFPA 704) Ratings:

Health	1	LEGEND	0 = minimal hazard
Flammability	4		1 = slight hazard
Instability	0		2 = moderate hazard
			3 = severe hazard
			4 = extreme hazard

(For natural gas from NFPA 325)

#### Hazardous Materials Identification System (HMIS) Ratings:

Health	1	LEGEND	0 = minimal hazard
Flammability	4		1 = slight hazard
Physical Hazard	3		2 = moderate hazard
			3 = serious hazard
			4 = severe hazard

(For methane from HMIS Chemical Ratings Guide)

**Prepared by:** AMEC Foster Wheeler  
Environment & Infrastructure  
Occupational Hygiene and Safety Group

**Phone Number:** (604) 294-3811  
**Preparation Date:** February 05, 2015

**Additional Information and Comments:** This MSDS has been revised and updated from the last revision date of January 26, 2012. All sections and the order that which they appear have been documented as per American National Standard – *For Hazardous Industrial Chemicals – Material Safety Data Sheets Preparation* (ANSI Z400.1-2004).

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for their own particular use.

**Information Sources:** Various

**Attachment O**  
**Emissions Summary Sheet**

**G70-A EMISSIONS SUMMARY SHEET**

Emission Point ID No.	Emission Point Type <sup>1</sup>	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS <sup>2</sup> (Specify VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>3</sup>		Maximum Potential Controlled Emissions <sup>4</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>5</sup>
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
TRUCKW	RELIEF VENT	TRUCK W	TRUCK W	NA	NA	NMNEVOC	0.0267	0.0053	NA	NA	GAS/VAPOR	EE-AP42
TRUCKW	RELIEF VENT	TRUCK W	TRUCK W	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	EE-AP42
TRUCKW	FUGITIVE	TRUCK W	TRUCK W	NA	NA	PM10	3.6771	0.7255	NA	NA	GAS/VAPOR	EE-AP42
FUG	FUGITIVE	FUG	FUG	NA	NA	NMNEVOC	0.0317	0.1388	NA	NA	GAS/VAPOR	EE-AP42
FUG	FUGITIVE	FUG	FUG	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	EE-AP42
EQUIP BD	VERTICAL	BD VENT	FUG	NA	NA	NMNEVOC	0.5620	0.0140	NA	NA	GAS/VAPOR	EE-AP42
EQUIP BD	VERTICAL	BD VENT	FUG	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	NOX	0.0490	0.2146	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	CO	0.0412	0.1803	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	NMNEVOC	0.0027	0.0118	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	PM10	0.0037	0.0163	NA	NA	GAS/VAPOR	EE-AP42
A1LH	VERTICAL	A1LH	A1LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	NOX	0.0490	0.2146	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	CO	0.0412	0.1803	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	NMNEVOC	0.0027	0.0118	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A2LH	VERTICAL	A2LH	A2LH	NA	NA	PM10	0.0037	0.0163	NA	NA	GAS/VAPOR	EE-AP42

G70-A Oil and Natural Gas Production Facilities  
Instructions and Forms

Emission Point ID No.	Emission Point Type <sup>1</sup>	Emission Unit Vented Through This Point		Air Pollution Control Device		All Regulated Pollutants - Chemical Name/CAS <sup>2</sup> (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>3</sup>		Maximum Potential Controlled Emissions <sup>4</sup>		Emission Form or Phase (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>5</sup>
		ID No.	Source	ID No.	Device Type		lb/hr	ton/yr	lb/hr	ton/yr		
A2LH	VERTICAL	A2LH	A2LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	NOX	0.0490	0.2146	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	CO	0.0412	0.1803	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	NMNEVOC	0.0027	0.0118	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	PM10	0.0037	0.0163	NA	NA	GAS/VAPOR	EE-AP42
A3LH	VERTICAL	A3LH	A3LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	NOX	0.0490	0.2146	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	CO	0.0412	0.1803	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	NMNEVOC	0.0027	0.0118	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	SO2	0.0003	0.0013	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	PM10	0.0037	0.0163	NA	NA	GAS/VAPOR	EE-AP42
A4LH	VERTICAL	A4LH	A4LH	NA	NA	HAPS	0.0009	0.0040	NA	NA	GAS/VAPOR	EE-AP42
PWTK1	VERTICAL	PWTK1	PWTK1	NA	NA	NMNEVOC	0.0610	0.2675	NA	NA	GAS/VAPOR	M - TANKS
PWTK1	VERTICAL	PWTK1	PWTK1	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS
PWTK2	VERTICAL	PWTK2	PWTK2	NA	NA	NMNEVOC <sup>1</sup>	0.0610	0.2675	NA	NA	GAS/VAPOR	M - TANKS
PWTK2	VERTICAL	PWTK2	PWTK2	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS
PWTK3	VERTICAL	PWTK3	PWTK3	NA	NA	NMNEVOC	0.0610	0.2675	NA	NA	GAS/VAPOR	M - TANKS
PWTK3	VERTICAL	PWTK3	PWTK3	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS
PWTK4	VERTICAL	PWTK4	PWTK4	NA	NA	NMNEVOC	0.0610	0.2675	NA	NA	GAS/VAPOR	M - TANKS
PWTK4	VERTICAL	PWTK4	PWTK4	NA	NA	HAPS	0.0000	0.0000	NA	NA	GAS/VAPOR	M - TANKS

G70-A Oil and Natural Gas Production Facilities  
Instructions and Forms

The EMISSION SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSIONS SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

- 1 Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.
- 2 List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases
- 3 Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- 4 Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).
- 5 Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; M = modeling; O = other (specify).

**Attachment P**  
**Other Supporting Documentation**

# Epic Natural Gas Analysis Report

## Sample Information

Sample Information	
Sample Name	3140491376_Four States A2H
Operator	Drew Nicholas
Injection Date	2014-04-14 15:13:58
NGA Phys. Property Data Source	GPA Standard 2145-09 (FPS)

## Component Results

Component Name	Raw Amount	Norm%	Gross HV (Dry) (BTU /IDL cu.ft.)	Gross HV (Sat.) (BTU /IDL cu.ft.)	Relative Gas Density (Dry)	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	0.2390	0.2376	0.0000	0.0000	0.0023	0.0262
Methane	96.8189	96.2560	974.4348	957.4711	0.5332	16.3490
Carbon Dioxide	0.1584	0.1575	0.0000	0.0000	0.0024	0.0269
Ethane	3.1342	3.1160	55.2714	54.3100	0.0324	0.8349
Propane	0.2064	0.2052	5.1750	5.0842	0.0031	0.0566
i-Butane	0.0071	0.0071	0.2314	0.2282	0.0001	0.0023
n-Butane	0.0180	0.0179	0.5853	0.5755	0.0004	0.0057
i-Pentane	0.0012	0.0012	0.0481	0.0481	0.0000	0.0004
n-Pentane	0.0015	0.0015	0.0603	0.0603	0.0000	0.0005
n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total:	100.5847	100.0000	1035.8063	1017.7760	0.5739	17.3027

## Results Summary

Result	Dry	Sat.
Total Raw Mole% (Dry)	100.5847	
Total Normalized Mole%	100.0000	100.0000
Pressure Base (psia)	14.730	
Temperature Base	60.0	
Flowing Temperature (Deg. F)	72.70	
Flowing Pressure (PSIG)	157.36	
Gross Heating Value (BTU / Ideal cu.ft.)	1035.8063	1017.7760
Gross Heating Value (BTU / Real cu.ft.)	1038.0202	1020.2990
Relative Density (G), Ideal	0.5739	0.5747
Relative Density (G), Real	0.5749	0.5759
Gas Density, Real (lbm / cu.ft.)	0.04399	0.04407
Compressibility (Z) Factor	0.9979	0.9975

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Tank Identification and Physical Characteristics**

**Identification**

User Identification:	Four States Pad Wells A1, A2, A3, A7
City:	Pittsburgh
State:	West Virginia
Company:	XTO Energy, Inc.
Type of Tank:	Vertical Fixed Roof Tank
Description:	Each tank is ran at 50 BWPD, This run will represent 1 tank at the facility. Amixture of 80% produced water and 20% Gasoline RVP12 is used for a very conservative estimate.

**Tank Dimensions**

Shell Height (ft):	22.00
Diameter (ft):	12.00
Liquid Height (ft) :	20.00
Avg. Liquid Height (ft):	8.00
Volume (gallons):	16,920.59
Turnovers:	45.30
Net Throughput(gal/yr):	766,500.00
Is Tank Heated (y/n):	N

**Paint Characteristics**

Shell Color/Shade:	Gray/Medium
Shell Condition:	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

**Roof Characteristics**

Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.17

**Breather Vent Settings**

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meteorological Data used in Emissions Calculations: Philadelphia, Pennsylvania (Avg Atmospheric Pressure = 14.73 psia)

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Liquid Contents of Storage Tank**

**Four States Pad Wells A1, A2, A3, A7 - Vertical Fixed Roof Tank**  
**Pittsburgh, West Virginia**

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min	Max		Avg.	Min.	Max.					
Produced Water	All	62.79	53.49	72.09	57.38	0.5821	0.4548	0.7424	42.7108	0.2000	0.8047	21.47	Option 2: A=8.10766, B=1750.286, C=235
Gasoline (RVP 12)						6.8983	5.8095	7.9440	64.0000			82.00	Option 4: RVP=12, ASTM Slope=3
Produced Water						0.2827	0.2023	0.3898	18.0200	0.6000	0.1853	18.02	Option 2: A=8.10766, B=1750.283, C=235

**TANKS 4.0.9d**  
**Emissions Report - Detail Format**  
**Detail Calculations (AP-42)**

**Four States Pad Wells A1, A2, A3, A7 - Vertical Fixed Roof Tank**  
**Pittsburgh, West Virginia**

<u>Annual Emission Calculations</u>	
Standing Losses (lb):	158.8525
Vapor Space Volume (cu ft):	1,621.0818
Vapor Density (lb/cu ft):	0.0044
Vapor Space Expansion Factor:	0.0873
Vented Vapor Saturation Factor:	0.6934
<b>Tank Vapor Space Volume:</b>	
Vapor Space Volume (cu ft):	1,621.0818
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	14.3333
Tank Shell Height (ft):	22.0000
Average Liquid Height (ft):	8.0000
Roof Outage (ft):	0.3333
<b>Roof Outage (Cone Roof)</b>	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.1700
Shell Radius (ft):	6.0000
<b>Vapor Density</b>	
Vapor Density (lb/cu ft):	0.0044
Vapor Molecular Weight (lb/lb-mole):	42.7108
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5821
Daily Avg. Liquid Surface Temp. (deg. R):	522.4802
Daily Average Ambient Temp. (deg. F):	54.2792
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	517.0282
Tank Paint Solar Absorptance (Shell):	0.6300
Tank Paint Solar Absorptance (Roof):	0.6300
Daily Total Solar Insulation Factor (Btu/ft <sup>2</sup> day):	1,263.2834
<b>Vapor Space Expansion Factor</b>	
Vapor Space Expansion Factor:	0.0873
Daily Vapor Temperature Range (deg. R):	37.2105
Daily Vapor Pressure Range (psia):	0.2877
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5821
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.4548
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.7424
Daily Avg. Liquid Surface Temp. (deg. R):	522.4802
Daily Min. Liquid Surface Temp. (deg. R):	513.1578
Daily Max. Liquid Surface Temp. (deg. R):	531.7828
Daily Ambient Temp. Range (deg. R):	18.2750
<b>Vented Vapor Saturation Factor</b>	
Vented Vapor Saturation Factor:	0.6934
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5821
Vapor Space Outage (ft):	14.3333
<b>Working Losses (lb)</b>	
Working Losses (lb):	376.1220
Vapor Molecular Weight (lb/lb-mole):	42.7108
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.5821
Annual Net Throughput (gal/yr.):	786,500.0000
Annual Turnovers:	45.2563
Turnover Factor:	0.6289
Maximum Liquid Volume (gal):	18,920.5925
Maximum Liquid Height (ft):	20.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
<b>Total Losses (lb):</b>	<b>534.9745</b>

**TANKS 4.0.9d  
Emissions Report - Detail Format  
Individual Tank Emission Totals**

**Emissions Report for: Annual**

**Four States Pad Wells A1, A2, A3, A7 - Vertical Fixed Roof Tank  
Pittsburgh, West Virginia**

Components	Losses(lbs)		Total Emissions
	Working Loss	Breathing Loss	
Produced Water	378.12	158.85	534.97
Gasoline (RVP 12)	302.65	127.82	430.47
Produced Water	73.47	31.03	104.51